WIAC Subcommittee 1
Report to the Workforce Information Advisory Council
June 21, 2017

Overview

Opportunities

Opportunity #1 – Aligning Education and Workforce Training with Industry Needs
Opportunity #4 – Understanding the Characteristics of the Workforce

Meeting Dates: May 15, May 19, June 2

Participants

WIAC members: Mark McKeen - chair, Angela Pate, Ellen Golombek
SME contributors: Becky Rust (BLS-OES, EP), David Talon (BLS-QCEW, JOLTS)
Presenters (external experts providing information): None

Materials

WIAC Subcommittee Guidance 2017-05.docx
Reference Materials: Opportunity 1.docx, Opportunity 4.docx, Key Resources for Opportunity 1.doc, Key Resources for Opportunity 4.doc, Data Sources Table- LMI Institute.pdf, WLMI Customers-Actions Influenced by LMI.docx, WLMI Improvement Efforts – Possible SMEs.docx, WLMI SWOT Summary.docx, Previous meetings' summary notes

Potential WLMI Improvements

Improvement 1 – Create a common or standardized data structure for workforce related information within a distributed knowledge management system that can be used by job seekers, employers, students, the national workforce system, institutions, educators and policy makers.

Need: Such standardizations could expedite the collection process and assist in expanding access of LMI information in frameworks that are more useful to the public. There are many systems that do not have the same definitions for things, including those that affect LMI.

Lack of standard definitions limits the ability for traditional closed database architectures to evolve into tomorrow's distributed knowledge management systems (DKMS). Other examples of systems working toward standardized definitions for distributed or public usage include (1) electronic health record standardizations for public/private institutional usage under highly constrictive HIPPA compliance regulations and (2) global financial institutions' Legal Entity Identifiers (LEI) as regulated by the LEI Regulatory Oversight Committee (www.leiroc.org).

Labor information needs to evolve along with healthcare and financial information to be used by many public and private stakeholders, through innovation and use of new technologies.

Rationale: Different data structures would enable methodologies such as human centered distributed information design and could lead to a future web-based knowledge management system.[1] Additionally, standards defined using such methodologies could provide greater opportunity

[1] See example: Human-centered design of a distributed knowledge management system such as Mission Control Center at NASA Johnson Space Center: http://www.sciencedirect.com/science/article/pii/S153204640400156X

for external application development, greater independent research and public usage of non-private or aggregate LMI information. Knowledge discovery and data mining (KDD) for knowledge management system design could facilitate solutions that convey (at the very least) the same level of user experience as retail shoppers can have finding just the right shoe or car or boat when they look for a job or an employer searches for an employee. "Inventory" for the labor supply chain could also be analyzed as well as is done in commercial applications using next generation web technologies based on standard data definitions. Once standards are defined, use of Semantic Web frameworks might prove useful such as the Probabilistic Resource Description Framework (pRDF).

Programs/Products Affected: Any products that currently depend on surveys/data collection may be affected by new data structure and search.

Implementation Issues: Data warehouse structures of closed databases (such as O*NET) should be leveraged and included into new Distributed Knowledge Management Systems. Users will be able to define new definitions to be commented upon and curated by peers in distributed systems. One example in O*NET today could be the occupation of a drone operator, which does not yet exist in O*NET, but is an emerging and increasingly high demand occupation as drones evolve beyond just military applications. If users populate their job posting in the same data formats used by O*NET, such postings could be 'mined' and curated by experts and peer reviewed for acceptance.

Summation: Once in a standard format, search engines can find more contextual data to provide a simpler and more usable user experience – increasing public usage for individuals, economic developers, teachers, business, etc.

Key Programs to consider:

- Rensselaer Polytechnic Institute - Tetherless World Constellation - Linking Open Government Data –James Hendler and Deborah L. McGuinness
- Rensselaer Polytechnic Institute - Health Empowerment by Analytics, Learning, and Semantics (HEALS) - James Hendler, director of the Rensselaer Institute for Data Exploration and Applications (IDEA)

Improvement 2 – Upgrade the WLMI system infrastructure to 21st century levels

Need: The current technological infrastructure (computer systems hardware and software) is old and cannot efficiently handle today's demands. Further, there is a wealth of information available, but it is often confusing and overwhelming to casual users of the data, especially individuals who do not have strong statistical knowledge or awareness of accessible information. This makes it difficult for many job seekers, career counselors, employers and policy makers to gain actionable insights from current sources.

Rationale: Like investments in roads and bridges, investments in WLMI systems infrastructure is needed and would go a long way to enable enhancements in the development of and access to data.

Programs/Products Affected: Any product in need of technological upgrade.

Implementation Issues: Time, money, resources.

Recommendations:

- Upgrade the technology infrastructure to improve user capability to find relevant workforce information for policy makers, educators, job seekers, employers and students. Additionally, such an upgrade should provide knowledge as opposed to only large volumes of information to decipher.

- Explore innovative programming approaches to improve machine learning and search relevancy for end users, specifically use of open source statistical software such as RStan and frameworks such as the Probabilistic Resource Description Framework (pRDF). Include new technologies aligned with global progress toward more intelligent knowledge systems in new versions of the World Wide Web.
- Recognizing that budget constraints may limit the scope of this improvement idea, we recommend developing a partnership with a key educational institution(s) and establishing an internship or cooperative education program (or more formal partnership program) with an objective to develop a 21st century technology roadmap for the DOL / BLS. This partnership should include U.S. private sector organizations willing to collaborate on such institutional research in public/private partnerships.

Key programs to consider:

- The Applied Statistics Center@ Columbia University – Andrew Gelman, Professor, Department of Statistics gelman@stat.columbia.edu
- MIT Computer Science and Artificial Intelligence Lab – Regina Barzilay, Delta Electronics Professor regina@csail.mit.edu
- Rensselaer Polytechnic Institute - Tetherless World Constellation - Linking Open Government Data –James Hendler and Deborah L. McGuinness
- Rensselaer Polytechnic Institute - Health Empowerment by Analytics, Learning, and Semantics (HEALS) - James Hendler, director of the Rensselaer Institute for Data Exploration and Applications (IDEA)

Improvement 3 – Enhance UI wage records

Need: Additional data elements added to UI wage records would enable production of valuable information not currently able to be produced.

Rationale: The addition of a few data elements, in particular an occupation indicator, to UI wage records would enable the production and evaluation of information on the alignment of training and education preparation with industry needs by occupation and the skills required by occupations, and would benefit employer hiring and retention as well as student and worker preparation decisions.

Programs/Products Affected: Unemployment Insurance (State UI agencies, ETA)

Implementation Issues: Changes to employer reporting systems and state UI data systems

Summation:

Improvement 4 –Produce labor turnover information at the state and county level

Need: Most hiring is local and the availability of state and sub-state labor turnover rates would help identify where there are issues that might be addressed by changes in local policies and practices

Rationale: Labor turnover information from the JOLTS program is only available at the national level due to insufficient sample size to produce this information for states and sub-state geographies

Programs/Products Affected: JOLTS (BLS)

Implementation Issues: Sample size expansion, cost

Summation:

Improvement 5 – Identify the changing structure of work in the U.S. economy

Need: A better understanding of the scope and volume of alternative work arrangements or other causes for reduction in workforce participation.

The following excerpt from a May 2017 BLS article, *Employed Workers Leaving the Labor Force: An Analysis of Recent Trends*[2]*,* sums up the need for researching this issue:

> "In summary, we have observed a large increase in the number of people who transition from employed to not in the labor force over the last 2 years, both overall and for workers ages 25–54.
>
> …. For workers ages 25–54, increases in education would similarly be predicted to lead to a decrease in exits (with little effect caused by aging within this group) instead of resulting in the substantial increase we observe. This increase may point to longer term changes in the desirability of work. This explanation is consistent with the analysis by Federal Reserve researchers that persistent declines in participation for some demographic groups are not cyclical but "appear to have their roots in longer run changes in the labor market."[7]

Rationale: The traditional nature of full-time employment with one employer is giving way to a growing segment of voluntary (contractual) and involuntary (part-time employment and contractual) work arrangements. A better understanding of this change would provide for a better understanding of its implications on businesses, individuals and families.

Programs/Products Affected: Contingent Worker Survey (BLS)

Implementation Issues:

- Implementing the Contingent Worker Survey every year as an ongoing data set.
- Expanding data collection about this growing segment of the workforce beyond the Contingent Worker Survey to gain a better understanding of the scope and impact of this trend.
- Addressing changes within the existing workforce development system to serve this segment of the workforce. LMI data related to training, employer job posting (demand), and workforce projections (supply) systems (such as Florida's LMI supply/demand system) would be affected by the workforce systems' activities serving this changing workforce.

Summation: With multiple projections showing significant variations in the volume of this new segment of the workforce, projections are needed that can be relied upon for policy makers, educators, employers and workers. All stakeholders need a better understanding of how it will affect worker benefits, safety, education, taxes, families and children, and local rural and urban communities. Shifts may affect crime rates, housing, transportation or other factors in local communities in ways not understood, as all significant changes in local labor markets can.

Resources:

- The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015
- McKinsey: Independent Work: Choice Necessity and the Gig Economy
- Slideshare: https://www.slideshare.net/frenchweb/independant-work-choice-necessity-and-the-gig-economy-par-mckinsey

[2] Harley Frazis, "Employed Workers Leaving the Labor Force: An Analysis of Recent Trends," *Monthly Labor Review,* U.S. Bureau of Labor Statistics, May 2017, https://doi.org/10.21916/mlr.2017.16.

Improvement 6 – Increase the availability of information on labor supply and demand

Need: There is a need for easily accessible supply-demand information at the local level

Rationale: Having good information on the supply of talent in and entering the workforce in relation to the needs of local industries is important to aligning education and training with industry needs.

Programs/Products Affected: State supply-demand analyses

Implementation Issues:

Summation: